

CITY AUDITOR'S OFFICE



AUDIT OF LAS VEGAS AREA COMPUTER TRAFFIC SYSTEM (LVACTS)

Report No. CAO 1502-0001-05

March 7, 2001

**RADFORD K. SNELDING, CPA, CIA, CFE
CITY AUDITOR**

March 7, 2001

Mayor Oscar Goodman
Councilman Gary Reese
Councilman Michael J. McDonald
Councilwoman Lynette Boggs McDonald
Councilman Larry Brown
Councilman Lawrence Weekly
Councilman Michael Mack
City of Las Vegas Audit Committee

Subject: CAO 1502-0001-05 - Audit of Las Vegas Area Computer Traffic System
(LVACTS)

Attached please find the report mentioned above. Management comments are attached at the end of the report.

Sincerely,

Radford K. Snelding, CPA, CIA, CFE
City Auditor

EXECUTIVE SUMMARY
AUDIT OF LAS VEGAS AREA COMPUTER
TRAFFIC SYSTEM
(LVACTS)
REPORT CAO 1502-0001-05

The purpose of the executive summary is to convey in capsule form the significant issues of the audit report. The executive summary is a vehicle for reviewing the report and should be used in conjunction with the entire report.

INTRODUCTION

The Las Vegas Area Computer Traffic System (LVACTS) was created by an interlocal agreement between the Nevada Department of Transportation (NDOT), the Regional Transportation Commission (RTC), Clark County, and the Cities of Las Vegas, North Las Vegas, and Henderson. Each of these entities has a representative on the Operations Management Committee (OMC) which oversees the operation and management of LVACTS.

LVACTS controls the timing and synchronization of traffic signals on major roadways in the Las Vegas valley. The City of Las Vegas is the central operator for LVACTS and has the responsibility of running the daily operations of the Traffic Control Center. An interim manager has been transitioning the staff over the past few months until a suitable replacement can be found. LVACTS has a staff of 10 employees with an operating budget of \$1,509,048 for the fiscal year ending June 30, 2001. Each entity contributes to the LVACTS operating budget based on the number of signals in its jurisdiction on the system.

NDOT provides capital funding for LVACTS. NDOT is currently funding and managing the upgrade from the old LVACTS system to a new system. The old system is being replaced because it is limited to handling only 500 signals and there are over 600 signals in the valley under LVACTS' control. The new system is decentralized instead of centralized like the old system. This is important because system problems in a centralized environment can and have impacted the entire valley. In a decentralized system, interruptions can be localized. The new system is expected to handle the expanded capacity and provide enhanced traffic engineering control and reporting.

Due to the City's limited role in the LVACTS system upgrade project, we did not conduct an extensive review of the project. However, in the course of our audit, we noted the following issues relating to the project that could have a significant impact on LVACTS:

- The original budget for the upgrade project was approximately \$7.5 million. After the project began, an additional \$1.5 million was budgeted for adding Henderson to the system. Nine years later, the project is approaching \$16 million and still not complete.
- No formal system engineering methodology is being followed by LVACTS.
- No distinct system development environment or testing environment exists within LVACTS.

OVERVIEW OF SIGNIFICANT ISSUES

We believe that controls were adequate and that LVACTS was operating effectively.

Our audit did, however, identify areas that management should consider which could improve efficiency.

- No formal system engineering methodology is being followed.
- No distinct system development environment or testing environment exists.
- Fund balances are maintained without a defined purpose.
- The City does not charge its indirect costs to LVACTS.
- Contingency and continuity plans do not exist.
- Hardware is not physically controlled.
- System monitoring is needed to ensure the integrity of the system.
- Performance evaluation methodologies are not being used to proactively optimize the system.

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**AUDIT OF LAS VEGAS AREA COMPUTER
TRAFFIC SYSTEM
(LVACTS)
CAO 1502-0001-05**

BACKGROUND

The Las Vegas Area Computer Traffic System (LVACTS) was created by an interlocal agreement between the Nevada Department of Transportation (NDOT), the Regional Transportation Commission (RTC), Clark County, and the Cities of Las Vegas, North Las Vegas, and Henderson. Each of these entities has a representative on the Operations Management Committee (OMC) which oversees the operation and management of LVACTS.

LVACTS controls the timing and synchronization of traffic signals on major roadways in the Las Vegas valley. The City of Las Vegas is the central operator for LVACTS and has the responsibility of running the daily operations of the Traffic Control Center. An interim manager has been transitioning the staff over the past few months until a suitable replacement can be found. LVACTS has a staff of 10 employees with an operating budget of \$1,509,048 for the fiscal year ending June 30, 2001. Each entity contributes to the LVACTS operating budget based on the number of signals in its jurisdiction on the system.

NDOT provides capital funding for LVACTS. NDOT is currently funding and managing the upgrade from the old LVACTS system to a new system. The old system is being replaced because it is limited to handling only 500 signals and there are over 600 signals in the valley under LVACTS' control. The new system is decentralized instead of centralized like the old system. This is important because system problems in a centralized environment can and have impacted the entire valley. In a decentralized system, interruptions can be localized. The new system is expected to handle the expanded capacity and provide enhanced traffic engineering control and reporting.

Due to the City's limited role in the LVACTS system upgrade project, we did not conduct an extensive review of the project. However, in the course of our audit, we noted the following issues relating to the project that could have a significant impact on LVACTS:

- The original budget for the upgrade project was approximately \$7.5 million. After the project began, an additional \$1.5 million was budgeted for adding Henderson to the system. Nine years later, the project is approaching \$16 million and still not complete.
- No formal system engineering methodology is being followed by LVACTS.
- No distinct system development environment or testing environment exists within LVACTS.

OBJECTIVES

We have completed an audit of LVACTS. Our objectives included the following:

- Review and evaluate system and operating controls.
- Review compliance with the interlocal agreement and laws and regulations.
- Determine whether City assets are safeguarded from loss.

SCOPE AND METHODOLOGY

Our audit was performed in accordance with generally accepted governmental auditing standards. We evaluated the efficiency and effectiveness of the Traffic Control Center operated by the City of Las Vegas. Audit procedures included:

- Reviewing LVACTS policies and procedures;
- Reviewing the LVACTS interlocal agreement;
- Interviewing LVACTS staff and management and OMC members;
- Observing LVACTS operations;
- Analyzing both financial and operational data related to LVACTS; and
- Evaluating security and access controls surrounding LVACTS.

CONCLUSIONS/FINDINGS / RECOMMENDATIONS

The City Auditor's Office appreciates the courtesy and cooperation extended by LVACTS personnel and participating agencies during this audit.

The following issues were identified during our audit. While other issues were identified and discussed with management, they were deemed less significant for reporting purposes.

A. ADMINISTRATION

1. PERFORMANCE EVALUATION

Criteria:

- Performance measures should be established and operational results should be monitored and evaluated to ensure goals are achieved.
- Other municipalities throughout the country regularly evaluate the timing and synchronization of their traffic signals to optimize the flow of traffic.
- The interlocal agreement requires an annual report detailing the performance be filed with participating agencies.

Condition:

- LVACTS does not have a formal traffic signal evaluation plan.
- Without a formal traffic signal evaluation plan, LVACTS management has been reactive rather

than proactive in addressing traffic flow issues.

- An annual report detailing the performance of LVACTS is not prepared and filed with the participating agencies.

Effect:

- LVACTS is not ensuring that the timing and synchronization of traffic signals are optimized.

Cause:

- LVACTS management has not adequately considered the value of a formal traffic signal evaluation plan.

Recommendations:

1. LVACTS management should develop appropriate performance measures and a traffic signal evaluation plan to ensure signals are optimally timed and synchronized.
2. As required by the interlocal agreement, the OMC should file an annual performance report to the participating agencies.

Management's Plan of Action:

Management comments are attached at the end of the report.

2. BUSINESS RESUMPTION PLAN

Criteria: A properly developed, maintained, and tested business resumption plan ensures that critical systems can be restored in the event of a failure.

Condition:

- LVACTS management has not developed a business resumption plan.
- LVACTS does not maintain an adequate supply of critical replacement equipment and parts as evidenced by the recent need to obtain replacement parts on an emergency basis.

Effect:

- Risk of traffic control disruption.

Cause:

- LVACTS management has not adequately considered the risk of operating without a formal business resumption plan.

Recommendations:

1. LVACTS management should develop a formal business resumption plan to avoid traffic control disruption.
2. LVACTS should regularly review, update, and test the business resumption plan.

3. LVACTS should identify critical equipment and parts and maintain spares as necessary.

Management's Plan of Action:

Management comments are attached at the end of the report.

3. PHYSICAL SECURITY

Criteria: Physical security controls are necessary to safeguard assets and prevent disruption of operations.

Condition: The following physical security weaknesses were noted at the LVACTS facility:

- The LVACTS facility is not adequately secured (i.e., doors left open, uncontrolled keys).
- A record of visitors to the LVACTS facility is not maintained and visitors do not require an escort while in the facility.
- Valuable system replacement equipment is being stored in an unsecured room.
- Equipment was recently stolen from the LVACTS facility.
- The application servers and networking equipment are not located in a secure, climate controlled room.

Effect:

- Potential for theft, equipment failure, and traffic control disruption.

Cause:

- LVACTS management has not performed a comprehensive physical security evaluation of its facility.

Recommendations:

1. LVACTS should ensure that the LVACTS facility is secure and that access is restricted to individuals who have been authorized by LVACTS management or the OMC.
2. LVACTS staff should maintain a log of all visitors and accompany visitors while in the facility.
3. All equipment and supplies should be stored in a secure area.
4. LVACTS management should take measures to improve the security surrounding the servers and networking equipment by placing them in a climate controlled, secure area only accessible to those with proper authorization.

Management's Plan of Action:

Management comments are attached at the end of the report.

4. FUNDING ALLOCATION

Criteria: All applicable costs of a joint operation should be fairly allocated to all participating organizations.

Condition:

- According to the interlocal agreement, funding for the LVACTS operating budget is based upon the number of traffic signals the participating agencies have on the LVACTS system.
- Each participating organization has incidental costs associated with their involvement in LVACTS.
- In addition to the City's involvement in the OMC, the City of Las Vegas hires and administratively supports LVACTS employees.
- Indirect costs of supporting LVACTS employees by the City of Las Vegas are not included in the LVACTS operating budget.

Effect:

- The City of Las Vegas is absorbing all indirect costs associated with being the central operator for LVACTS (approximately \$137,000 in the current fiscal year).

Cause:

- The City does not charge its indirect costs to LVACTS.

Recommendations:

1. The City Manager's Office should request reimbursement of \$137,000 from LVACTS for indirect costs related to LVACTS over the past year.
2. The City Manager's Office should ensure that future agreements and amendments (including the FAST agreement) include language in which the City is compensated at the City's burden rate.
3. Indirect costs associated with being the LVACTS central operator should be included in the LVACTS operating budget.

Management's Plan of Action:

Management comments are attached at the end of the report.

5. FUND BALANCE

Criteria: Significant fund balances should be justified and approved.

Condition:

- As of June 30, 2000, LVACTS had an unreserved fund balance of \$500,000 which represents approximately 33% of annual operating expenditures.
- Justification for this significant unreserved fund balance was not submitted for approval.

Effect:

- Potential use of fund for unauthorized expenditures.

Cause:

- While LVACTS believes the unreserved fund balance is necessary for emergency purposes, the interlocal agreement does not stipulate the need for a contingency fund.

Recommendation:

LVACTS management should justify the need for a significant fund balance and have it properly approved.

Management's Plan of Action:

Management comments are attached at the end of the report.

6. TRAINING

Criteria: Proper training of employees ensures that employees have the required knowledge and skills to perform their jobs.

Condition:

- The LVACTS system administrator did not, until recently, receive needed training in Windows NT administration. The administrator purchased books and manuals without reimbursement.
- The LVACTS system manager has received no formal training in media relations despite being designated as the LVACTS spokesperson.
- LVACTS staff have not, until recently, received any formal training.
- Individual job responsibilities and procedures are not formally documented and LVACTS does not have a cross training program for staffing back up and succession.
- Training for OMC members is being funded by LVACTS rather than by the entities each OMC member represents.

Effect:

- LVACTS management and staff may not have the knowledge and skills required to perform their jobs.
- Employee turnover creates a loss of critical knowledge.

Cause:

- Training has not been prioritized to meet operational needs.

Recommendations:

1. LVACTS should invest in training and required technical manuals for its employees to ensure they have the knowledge and skills to properly perform their jobs.
2. LVACTS management should create job responsibility and procedure manuals and establish a cross-training program to limit their exposure to loss of knowledge with employee turnover.
3. LVACTS should discontinue payment of training for OMC members.

Management's Plan of Action:

Management comments are attached at the end of the report.

7. OVERTIME

Criteria: According to the Fair Labor Standards Act, hourly employees must be compensated for overtime hours worked.

Condition:

- As LVACTS employees oversee a system that operates 24 hours a day, seven days a week (24/7), they occasionally must work overtime.
- Employees are working overtime without overtime being formally approved, reviewed, and tracked.

Effect:

- Risk of dispute with employees regarding compensation for overtime hours worked.
- Potential violation of the Fair Labor Standards Act.

Cause:

- LVACTS management has not established an overtime compensation arrangement.

Recommendation:

LVACTS management should establish formal overtime procedures for their employees.

Management's Plan of Action:

Management comments are attached at the end of the report.

B. SYSTEM CONTROL

1. SYSTEM ACCESS

Criteria: Logical access to system code and data should be restricted.

Condition:

- Access to the LVACTS system does not require a system access password.

Effect:

- The LVACTS system is susceptible to unauthorized modifications.

Cause:

- LVACTS has not established an adequate system access control methodology.

Recommendation:

LVACTS management should establish and implement strict password rules to prevent unauthorized system access.

Management's Plan of Action:

Management comments are attached at the end of the report.

2. SYSTEM BACK-UP AND RESTORATION

Criteria: System back-up and restoration procedures should be documented and implemented.

Condition:

- While system back-ups are performed, written procedures do not exist outlining back-up and restoration procedures.
- System back-up tapes are not periodically tested.
- System back-up tapes are stored both onsite and at an employee's home rather than at a secure, climate controlled offsite location.

Effect:

- Data recovery could be incomplete causing traffic delays.
- Back-up tapes could be lost, damaged, or inaccessible when restoration of the traffic control system is needed.

Cause:

- LVACTS management has not formalized system back-up and restoration procedures.
- LVACTS management has not arranged for adequate offsite storage of back-up tapes.

Recommendations:

1. LVACTS management should reassess the adequacy of the current system back-up and restoration procedures (Appendix A).
2. System back-up and restoration procedures should be documented and implemented.

Management's Plan of Action:

Management comments are attached at the end of the report.

3. PREVENTIVE MAINTENANCE

Criteria: Preventive maintenance should regularly be performed to ensure that critical systems are operating properly.

Condition:

- Regular preventive maintenance of equipment is not being performed.
- LVACTS has noted problems with critical equipment (e.g. microwave equipment, controllers) due to a lack of regular maintenance.
- During 1999, the traffic control system failed due to depleted emergency batteries that had not been replaced as recommended by the manufacturer.

Effect:

- LVACTS could encounter system problems which could lead to traffic control disruption.

Cause:

- LVACTS has no formal preventive maintenance program.

Recommendation:

LVACTS should establish and implement a formal preventive maintenance program.

Management's Plan of Action:

Management comments are attached at the end of the report.

4. STANDARDIZATION OF HARDWARE AND SOFTWARE

Criteria: Standardization of system hardware and software leads to improved system performance and less downtime.

Condition:

- LVACTS has experienced hardware malfunctions with the communications equipment as a result of using various types of controllers and modems.
- Changes in software have caused interface problems with system hardware.

Effect:

- Increased costs of repair and maintenance.
- Higher risk of system failure.

Cause:

- Lack of hardware and software standards.

Recommendation:

LVACTS Management should work with the OMC to develop hardware and software standards.

Management's Plan of Action:

Management comments are attached at the end of the report.

5. SYSTEM MONITORING

Criteria: Systems should be monitored to ensure they are operating properly.

Condition:

- LVACTS does not have system-monitoring tools such as anti-virus, change control, and system performance software.
- Communication and controller errors are recorded, but not reviewed and analyzed.
- The central traffic control center is not manned 24 hours per day / 7 days (24/7) per week.

Effect:

- System may operate at sub-optimal levels without notice.
- The traffic control system could fail and remain down if not monitored 24/7.

Cause:

- LVACTS management has not implemented fundamental system monitoring measures.

Recommendations:

1. LVACTS should implement system-monitoring tools such as anti-virus, change control, and system performance software to maintain the integrity of the traffic control system.
2. LVACTS should maintain electronic records of communication and controller errors.
3. LVACTS management should perform a cost-benefit analysis for staffing LVACTS 24/7 for monitoring purposes to decrease traffic congestion.

Management's Plan of Action:

Management comments are attached at the end of the report.

Prepared by:

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Senior Information Technology Auditor

Approved by:

Radford Snelding, CPA, CIA, CFE
City Auditor

C: Mayor
City Council
City Manager's Office
Audit Committee
City Clerk's Office

APPENDIX A - SYSTEM BACK-UP AND RESTORATION BEST PRACTICES

- A strategy for back-up and restoration should ensure that it includes:
 - A review of business requirements;
 - Development of a recovery plan;
 - Implementation of a recovery plan;
 - Testing of a recovery plan; and
 - Documentation of a recovery plan.
- Back-up procedures should be written to include the frequency (daily, weekly, monthly) and scope (full, incremental, and differential back-up) of the back-up.
- Back-up procedures should include the proper storage of the data files and software. For example, storing files 1 mile away is not appropriate if the user is trying to protect against an earthquake.
- Back-ups should be stored securely. Storage sites periodically should be reviewed regarding physical access security and the security of data files and applications.
- System back-ups should be brought on a regular basis to an appropriate offsite location which can properly store the media.
- System back-ups should be reviewed periodically to ensure the necessary files are being backed-up.
- Media library management responsibilities should be defined. Procedures to protect the media library contents should be established.
- Standards should be defined for the external identification of magnetic media (magnetic tape, cartridge, disks, and diskettes), and the control of their physical movement and storage to support accountability.



Friday, January 12, 2001

Mr. Radford K. Snelding, CPA, CIA, CFE
City Auditor
Mr. Bill Cimo, CISA
Senior Information Technologies Auditor
City Auditors Office – Third Floor
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Las Vegas, NV 89101

REF: City Auditor's Office (draft) report # CAO 1502-000-0X, of the Las Vegas Area Computer Traffic System, dated December 19, 2000

Dear Mr. Snelding:

The Operations Management Committee (OMC) and the current Las Vegas Area Computer Traffic System (LVACTS) Management has developed this response letter after review of the city Auditor's Office (draft) report # CAO 1502-000-0X, of the Las Vegas Area Computer Traffic System, dated December 19, 2000. There are several issues that were mentioned in the report that were identified as areas to be investigated for efficiency improvements, and this is a consolidated letter addressing those comments. As an appointee of the OMC for the LVACTS organization, this office has been tasked to combine any comments that were received from the Member Agencies, as well as developing "internal" responses.

Something of great importance the Committee members would like to stress is the uniqueness of the entire LVACTS organization. It is an excellent example of how local government, state government, and other public agencies can act together to provide a consolidated approach toward solving an important regional issue such as traffic signal coordination and timing. When formed, it was one of the first truly inter-jurisdictional Traffic Management Centers (TMC) in the entire country, and even today it is a model that many other public agencies come to visit, to see how it can be emulated. These interested parties, that visit us and observe our operation, use LVACTS as an example of how separate public entities can operate in an efficient, effective, and cooperative way for the benefit of the motorists and taxpayers.

There were points brought up within this audit that the OMC had already realized, and had begun acting proactively in dealing with these issues. This fact is demonstrated by their actions, as seen in the monthly minutes. After review of these, it is obvious most every one of these issues that were under OMC/LVACTS control were being addressed within the last several years, by the Committee's direction. A recent transformation with LVACTS was signaled as the OMC appointed a new Acting System Manager in April to lead the organization. A renewed focus on accomplishing the desires and direction of the Committee has been stressed, with this new management. Because of this, there has been considerable forward movement in keeping this organization the premier example of public entities with the Las Vegas Valley working in harmony with one another.

As the report stated, the core function of the LVACTS organization is to control the coordination of the traffic signals on arterials within and between jurisdictional boundaries, on non-peak travel times. Currently, there are nearly 600 devices under LVACTS control, with this number increasing every month, because of the efforts of competent LVACTS technical and support staff. As with other local public services, LVACTS is experiencing the growing pains that all public agencies are feeling of trying to "do more with less." This group of conscientious employees has, however, been able to perform well under this increasing pressure, and endeavors to keep providing this high level of service on into the future.

Keeping these points in mind, the following statements are the management responses to the draft audit as well as the timetable, as requested by the auditor.

In the introduction of the "Findings/Recommendations" section, audit makes several statements dealing with the system upgrade project. The Committee feels that this information should be removed from the audit, because it cannot be verified. They feel the portion concerning the upgrade project and Nevada Department of Transportation's management is not subject to the city auditor's review and should be removed. It should also be removed due to the inaccuracies caused by a lack of both historical perspective and technical expertise in the field of Traffic Engineering or Intelligent Transportation Systems (ITS).

- Further research would indicate the amounts stated as costs within the audit reflect entirely different scopes of work, though that is not stated or even inferred within the statements.
- Additionally, with further investigation, one would find that the consultant's sub contractor supplying the system software does in fact have a distinct test and development environment, though it is not located within the Las Vegas area, but rather at various locations within the United States. Along with this extensive testing network, there has been further final testing that took place locally to verify proper operation.
- Finally, contrary to the audit's findings, the consultant's sub contractor supplying the software does indeed follow specific methodologies when developing its software. They are a large, multinational corporation with a reputation in Intelligent Transportation System (ITS), that must incorporate specific processes in the development of any software products.

The facts do not concur with the allegations within the audit, and should be considered when reading them.

ADMINISTRATION

1. PERFORMANCE EVALUATIONS

1. Audit recommends that LVACTS management should develop appropriate performance measures, and traffic signal evaluation plan to ensure signals are optimally timed and synchronized.

Management's Plan of Action and Timetable:

There is some concern by the Committee and LVACTS management that this statement infers once we install a traffic signal, we never revisit the location or modify the coordination parameters. This is not, nor ever has been, the truth. We act proactively as we:

- observe traffic situations as they change because of development of land that affects the traveled corridors;
- receive both specific and general direction from the parent agencies' Traffic Engineering staff with respect to traffic signal coordination and timing;
- evaluate locations and traffic situations that are brought to our attention from concerned citizens;
- analyze arterials following the installation of new traffic signals or modification of any traffic control devices;
- continually modify and improve the coordination on the traffic signals under TMC control, by way of engineering analysis and fields observation.

We are not like most "other municipalities throughout the country," and due to the area's dramatic growth, we must operate in a much more dynamic environment. Accordingly, we visit arterial progression on major roadways several times a year in many cases, whereas some municipalities need only review their traffic signal's operation every five to ten years.

In addition to these important activities just mentioned, the direction given by the OMC for the last two years has been for the LVACTS management to begin tracking this work spent on traffic signal timing and re-timing projects. Additionally, performance measurements were requested Committee, as well as establishing bench marks for any of our primary performance measurements.

In the first proactive step, the current LVACTS management proposed, and the OMC approved, the purchase a traffic signal system timing optimization program. We selected the most widely used and accepted program by the Traffic Engineering community that was

available on the market today. Synchro and SimTraffic are used to help model the traffic signal timing parameters, vehicle progression on arterials, and overall delay to the vehicles within the entire system. Following this purchase, LVACTS sent two key staff members to training in Dallas, Texas by the developer of the software, and the initial entry of the technical data has begun by these LVACTS employees. When completed, we will use this program as another tool to help validate the coordination parameters that we use in our traffic signal system timing.

The process of entering this data is meticulous, and requires a great deal of raw data and information such as intersection turning movement counts and roadway geometrics. This initial process of building the original network will take considerable time, because it is not just for the city of Las Vegas, but for the entire valley. Currently, some of this data is available, and we have a consultant acquiring nearly 300 additional locations. Further count data acquisition, software operational training, intersection geometric field research, and substantial technical data entry is required to have a reliable model to make accurate decisions with regards to modifications in traffic signal coordination.

In addition to these programs, we are investigating the acquisition of Passer II, Transyst 7F, and HCS to also help evaluate traffic signal timing parameters. Each of these programs have their strengths and weaknesses in traffic signal simulation, and must be used for specific applications. No matter which software program we use, however, with the copious amounts of data to be entered, it will take considerable resources to complete the original seeding of the network. Nonetheless, we are confident we can have a substantial portion of the model populated within a year, if we can get our newly-budgeted positions filled in the near future.

Another improvement recommended by the current LVACTS manager and approved by the OMC was the purchase of hardware and software needed to perform travel time and delay studies (known as a “chase vehicle study” or “floating vehicle study”). With this equipment, we will begin to periodically track the time taken to drive a given arterial at a certain time. This will be valuable information when determining where improvements can be made to the coordination timing. According to the supplier, this equipment must be installed in a late model vehicle, so we are awaiting the arrival of one of the vehicles that was budgeted by the OMC for FY 00-01. Vehicle Services has told us that it should be arriving in the near future, possibly as early as February. After installation of this equipment, we will begin establishing a base line, then develop a periodic schedule when we actually begin monitoring the arterials we control. Only after this program has begun, can we determine the resources needed to effectively carry out this ambitious, but necessary, program, and in what time frame.

The other method stressed by the Committee of measuring performance has to do with staff and resource allocation. This process was conceived by current management and developed with the assistance and input of LVACTS staff. It has started to be used by all employees in the LVACTS organization. It is as follows:

- Three months ago a “Task Management Program” was implemented, whereby all staff members are beginning to track all of their time spent during the day to specific tasks.
- The second phase of this project is just beginning to be implemented with a “Complaint Tracking System.” This will allow us immediate feedback to all complaints that come into the TMC, to help us determine if our actions are sufficient or need to be modified.
- The third aspect of our complete performance measurement system is to be the “Work Orders.” These will identify the exact work performed on any given task, and allow the agencies the ability to know the extent of work performed on their assets.

This data will be entered into an Access database, and will be available for retrieval with specific queries for historical purposes. Current LVACTS management is phasing this new program in, and hopes to have it online and fully functional within the next eight to ten months.

2.) The audit recommends that the OMC file an annual performance report to the participating agencies.

Management’s Plan of Action and Timetable:

The accumulated data discussed in the previous section (1.1.) will help the LVACTS organization and the OMC file an annual performance report to the participating agencies. As an appointee of the Committee, the LVACTS manager should be the drafter of this document, and submit it to the OMC for approval. Some of the information that will be part of this annual report will be as a result of a new idea proposed by the current LVACTS Manager. If the Committee is so inclined, he will be scheduling a “Technical Review Meeting” every three to six months. During these meetings, all member agencies will have technical staff present, and will discuss any timing modifications made to the coordination parameters of any devices within the system, as well as the reason for the change. Also, at this time, any future projects will be discussed or considered. All agencies will be able to provide input to LVACTS, and LVACTS staff will be able to explain the reasons for their decisions. This will be a casual, technical meeting, in a cooperative environment, and the discussion will be recorded in document form for all of the member agencies to read; the annual report can be formulated from this information.

BUSINESS RESUMPTION PLAN

1. Audit recommends LVACTS management should develop a formal business resumption plan to avoid traffic control disruption.

Management’s Plan of Action and Timetable:

Ever since the original LVACTS hardware was installed and activated, and turned over to the agencies for maintenance by Pinnel, Anderson, Wilshire, and Associates (PAWA) in 1984, there has

been a very effective business resumption plan in effect. These procedures have kept traffic control disruption to a minimum, and have worked quite well since that time; this continues on to today. In fact, after discussion with staff, it seems that the central computer's "up time" has been near 99.9%.

Accordingly, when a failure occurs on the UTCS system (old system), a phone call to key individuals is automatically placed to their home phones numbers as well as their cellular phones. Upon arrival to the Traffic Management Center (TMC), these qualified individuals assess the situation, whether it be software or hardware, and determine the extent of the failure. Repairs are immediately initiated, if possible, or a local company is contacted, who is under contract, for additional resources. This process has worked quite effectively since the system was originally put into service, and we have no reason to think it would not continue to be effective.

It is understandable that someone not familiar with this organization may not be able to see how effective our procedures are, but that does not mean they do not exist. In fact, during the first decade of the organization, there were only a few staff members, and this sparse staffing allowed for distinct tasks to be performed by specific individuals.

Current LVACTS management, however, also understands the audit's concern that a more formalized, well-documented plan may become more critical as the organization grows in numbers and sophistication. Therefore, though the processes in effect have performed worked well up to now, we will now write down these procedures for business resumption in the event of an "old system" failure within the next six months.

As for the new the "new system," the required documentation concerning the necessary information needed to reinitiate the system following a software failure will be supplied by the system integrator before final acceptance. We are anxiously awaiting this information, and fully expect it to be delivered by the consultant, when the system is fully installed.

2. Audit recommends LVACTS should regularly review, update, and test the business resumption plan.

Management's Plan of Action and Timetable:

LVACTS will continue to review and update its business resumption plan as it has since it began operations. As the situation exists today, testing of a plan by taking the central computer "off-line" would cause substantial negative impact to the motorists and users of the valley's roadways. It is important to understand, however, that the motoring public's reliance on this older equipment is being minimized every day as we remove traffic signals from the UTCS (old system) and place them on the new ICONS/2070N-based system (new system).

As for the new the "new system," the required documentation dealing with the business resumption plan will be completed following the acceptance of the system. Following the acquisition of this documentation, a comprehensive, thorough, and well thought out plan will be implemented and followed.

3. Audit recommends LVACTS should identify critical equipment and parts and maintain spares as necessary.

Management's Plan of Action and Timetable:

With the help of the outside company who is contracted to assist LVACTS in maintaining the UTCS system (Davon), we have been actively searching for spare parts to keep the "old system" central computer functional. The Perkin-Elmer 3230 central computer is of 1970's vintage, which proves quite difficult in obtaining these spare parts. Notwithstanding this difficult situation, we acquired a variety of standby replacement equipment that was decommissioned by the city of El Paso, Texas nearly a year ago. These replacement parts will become helpful to us in the event of a potential failure in the future. Accordingly, we will continue to search for any parts that will help us keep our UTCS system operational. Once again, we will stress that it is becoming less and less important for continuity of system operation as each day passes.

As for the "new system," in that past year we have demonstrated the ability to resume operation following the failure of various pieces of communications and networking hardware (during at least four separate situations). It should be understood that just as a person may not know the exact component that will fail in a new car or a new house, we are in a learning curve with our new system, as well. We understand that components may fail, and accordingly, the most critical ones are already stocked, or in the process of being identified as they fail. In fact, LVACTS has spent over \$85,000 on system maintenance equipment since new management took the helm eight months ago, with another \$40,000 programmed to be purchased in the near future. Other non-critical components may fail and will be discovered as time passes, then we will stock these required replacements at that time. We believe it is fiscally irresponsible to the taxpayers to stock equipment that may never fail or is of minimal consequence in the event of failure, and as all government agencies should, we are consistently seeing how we can provide the best services to the citizens in the most efficient fashion.

3. PHYSICAL SECURITY

1. Audit recommends that the facility is secure and that access is restricted to individuals who have been authorized by LVACTS management of the OMC.

Management's Plan of Action and Timetable:

Following the departure of the former System Manager, the keys to all to the building's locks were changed as a matter of standard procedure. At that time, the two doors in the rear were changed to accept the city's Grand Master key, which is a closely controlled key, according to the city's locksmith shop. The front door keys were changed as well, and all of the LVACTS staff have keys. This was a decision by current LVACTS management because of a change in administrative policy, to help the LVACTS staff keep lines of communication open between the front and back office. As such,

all staff members are now required to enter and exit through the front door. The back door should only be used for deliveries, loading/unloading of equipment, or emergencies.

In addition to this, the OMC has requested that LVACTS management look into additional security measures to be implemented. Discussions have been held with external security companies, and some suggestions have included camera surveillance, as well as armed response by a private company. This process is currently underway, and a recommendation by LVACTS staff should be forthcoming within the next six months. At that time, LVACTS management will ask the Committee if it feels if any other efforts are in order to secure the facility and assets.

2. Audit recommends staff should maintain a log of all visitors and accompany visitors while in the facility.

Management's Plan of Action and Timetable:

The suggestion for a visitor's log book will begin as soon as we acquire the log book from the office supply store; we hope this will be within the month. Additionally, LVACTS management will reinforce a policy that has existed in the past, whereby all visitors will be accompanied while within the facility. This has historically been practiced, but will be monitored and more strictly followed in the future.

3. Audit recommends that all equipment and supplies should be stored in a secure area.

Management's Plan of Action and Timetable:

This recommendation will be put into place as soon as the land adjacent to the TMC is approved by the State of Nevada for the placement of a separate trailer to house maintenance staff and materials, as well as an additional storage shed. When these buildings are in place, the necessary space within the TMC will be freed up to securely store equipment and supplies needed for the system's operation and maintenance. We have been waiting the final notification of approval of this agreement from the State, and once finalized, we will proceed with the building acquisition, as approved by the OMC.

An additional measure has been developed by the current LVACTS management, and approved by the OMC. Asset tracking is in the best interest of all stakeholders in the LVACTS organization, and is just beginning to take shape. In early January, we received durable asset numbering labels and will begin placing them on all devices purchased by any source and used or maintained by the organization. This equipment will be tracked on an Access database, and will be the start of a program to track and secure all equipment and supplies used by LVACTS. This process will begin as soon as we can get the procedure in place, but will take considerable time to fully complete due to the number of assets for which LVACTS is responsible. In fact, it will never be complete, since assets are always being added to the LVACTS organization.

- 4 Audit recommends that LVACTS management should take measures to improve the security surrounding the servers and networking equipment by placing them in a climate controlled, secure area only accessible to those with proper authority.

Management's Plan of Action and Timetable:

This is a suggestion that will cost considerable amount of taxpayer's money, thus must not be taken lightly. We will need to establish some costs for this addition, and take this suggestion to the Operations Management Committee for discussion, as well as the State of Nevada, since they own the facility. It is interesting to note, even though stated otherwise, the specific area where the servers are located is already climate controlled (both humidity and temperature). This fact, in addition to the additional security measures suggested in the audit that are being implemented, the area will be much more secure, so additional measures seem unneeded. Furthermore, this substantial cost may not be justified if it is determined that this equipment will be relocated within the next year as part of the Freeway and Arterial System of Transportation (FAST) upgrade. This will be discussed at a future OMC meeting for resolution.

4. FUNDING ALLOCATION

- 1 Audit recommends that indirect costs associated with being the LVACTS central operator should be included in the LVACTS operating budget.

Management's Plan of Action and Timetable:

The fact that this recommendation was not addressed in the original LVACTS inter-local agreements or subsequent addendums makes it difficult to be unilaterally implemented by any party. If any party chooses to proceed with this recommendation, either the original agreement must be modified by an addendum, or this cost must be brought up during the regular annual budget process, and approved by a majority of the voting OMC members. If neither of these are accomplished, legal counsel should be sought to determine if this may be a breach of contract.

5. FUND BALANCE

1. Audit recommends that LVACTS management should justify the need for a significant fund balance and have it properly approved.

Management's Plan of Action and Timetable:

Throughout the history of LVACTS, the Committee believes that fund balances have been "properly approved" through the budget process spelled out within the binding inter-local agreement, and generally accepted accounting principles used with the city's finance structure. Costs associated

with maintaining the traffic control system are estimated by the LVACTS management, and approved by the OMC for the following Fiscal Year (FY). Any of the budgeted funds that were not spent in that year are then transferred to “ending fund balance.” LVACTS or the OMC has never been told that these amounts were excessive by the city’s Finance Department, according to state law, or by anyone else for that matter. In addition, historically, LVACTS management and the OMC have been left with the impression that these funds were available in the event of a catastrophic failure of the system. To achieve equity to all funding members, if such an event were to occur, the city, or any other member agency, would not be required to cover the entire funding shortfall, but the burden would fall equally across all member agencies.

Since current LVACTS management and the OMC have found out this year that these funds cannot be spent unless specifically identified, the OMC has taken action in FY01-02 budget to approve approximately two months worth of operating expenses (about \$250,000) be left in ending fund balance FY00-01. The remainder of any funds over this amount will be put into Special Department account for FY01-02. This allows the OMC and LVACTS management to allocate these funds for specific equipment or projects needed for the system maintenance and operation, including the purchase of additional components needed for system continuity in the event of a catastrophic failure.

6. TRAINING

1. Audit recommends that LVACTS should invest in training and required technical manuals for its employees to ensure they have the knowledge and skills to properly perform their jobs.

Management’s Plan of Action and Timetable:

With strong concurrence from the OMC, current LVACTS management has sent staff to various training sessions in the last year, as well as providing additional resources (and this is just the beginning). Staff has been given training:

- to certify staff members for Fiber Optic repair, installation, and maintenance;
- for Synchro/Simtraffic modeling and simulation software for traffic signal timing optimization;
- for International Municipal Signal Association (IMSA) certification training.
- for a self-paced training course with hard copy manuals and accompanying CDs for Microsoft Certified System Engineer (MCSE) certification.

Training of staff is a priority to the current LVACTS management and has always been of paramount concern to the OMC, since they understand the importance of training to operate and maintain the sophisticated, cutting-edge system that will be accepted in the near future.

Nowadays, even the employees within the organization are asked to remain vigilant for training opportunities they can find that would allow better performance in the course of their jobs; this has been a source of two different training opportunities paid for by the organization that helped staff develop themselves in their occupation. The current LVACTS management is pursuing additional training for staff in relation to:

- the communications infrastructure (AML Wireless);
 - network administration (NT Administration and Networking);
 - utilization of traffic signal modeling software (Synchro/SimTraffic and others);
 - and other courses in traffic engineering fundamentals;
 - as well as any other programs that develops the staff's competence in the course of their job; these include additional college courses related to professional development.
- 2 Audit recommends LVACTS management should create job responsibility and procedure manuals and establish a cross-training program to limit their exposure to loss of knowledge with employee turnover.

Management's Plan of Action and Timetable:

Cross training is a great idea, and will be pursued to the level that is possible by current management. As the sophistication of the system increases, so does the complexity of assignments required by staff. In turn, specialization within one's responsibilities becomes more of a reality. This is not to say that we cannot cross train individuals, but due to the diverse backgrounds needed to perform specific functions, it may only be to a certain level.

Nonetheless, when an individual in the organization approaches us and expresses a desire to "cross train" in another position, we do what we can to accommodate them. This interest by staff members is demonstrated by stating it in their Career Development Action Plan (CDAP). We must verify that they have the appropriate training, education, and background (i.e. clerical to clerical, technical to technical, managerial to managerial), and only then we can move forward. Limited cross training is appropriate and desirable, but caution must be used that in the process we do not "work someone outside their classification," for that could be construed as a contract violation with the binding City Employees Association (CEA) agreement, and this action is not acceptable by the OMC, or current LVACTS management.

As for the suggestion of developing job responsibility guidelines, these are being developed along with a general reorganization of LVACTS approved by the OMC last year. In conjunction with this reorganization, we are reviewing all duties performed by staff at the TMC, and working with Human Resources in developing appropriate job descriptions. Much of the technology has changed, and even more change is to come, as the new system undergoes final acceptance. These changes require a realignment of duties by all staff members, and this process is a work in progress. This entire process will take at least another year to fully complete, but

will be well worth the effort to help the organization acquire the appropriate personnel in future hiring decisions.

After this realignment process is complete, all staff members will assist management in developing procedure manuals in relation to their jobs. These will then be compiled by management into a portfolio, and made available for use by employees that may follow. As the system evolves, so will these manuals, thus these will never be completely done.

3. Audit recommends LVACTS should discontinue payment of training for OMC members.

Management's Plan of Action and Timetable:

LVACTS management, as well as the OMC members, feel this suggestion would not be in the best interest of the LVACTS organization; in fact, it will quite likely be extremely detrimental to the healthy future of the LVACTS organization. With the advances in technology incorporated into our advanced traffic control system, along with the leading-edge traffic engineering concepts that will be required to operate and maintain it, considerable training and on going education with the latest industry trends is not only desirable, but a necessity.

Another point to consider, is the fact that each agency has a single vote no matter how large or small their fiscal responsibility is. This would mean that each and every Committee member must be trained to the fullest level so they can take part in their leadership role. As such, they will effectively guide the LVACTS operation in the most efficient manner. With this training, well-informed decisions will be made that will save the LVACTS organization, then pass on these savings to the city and valley taxpayers. This can only be accomplished by staying current with recent industry trends by way of a highly-trained, well-educated group of individuals leading the LVACTS organization.

Additionally, it is important to remember that knowledge gained by a single member can be spread out across the entire Committee, since no one member can attend all of the seminars and conferences. However, spread out across the entire Committee, more complete coverage and dissemination of knowledge sources would present themselves, which in turn would benefit the entire organization. This training is too important to be overlooked by any one of the agencies, and will easily save ten-fold what it costs to the system in forward-thinking decisions. With these issues kept in mind, the auditor's suggestion will be discussed by the OMC, and voted on during the FY 02-03 annual budget process, since it has been approved up until that time.

7. OVERTIME

Audit recommends LVACTS management should establish formal overtime procedures for their employees.

Management's Plan of Action and Timetable:

Current LVACTS management has a strict policy that adheres closely to the CEA agreement, Article 23, ever since he took the position. All overtime, with the exception of "emergency" overtime, must be approved by management in advance, and will be paid accordingly. Existing management does not deviate from this, for it would be a contractual violation. This policy will continue to be practiced by the current LVACTS Manager, while he holds this position, and will be reinforced by the OMC to any manager that may follow.

To ascertain whether there is any overtime that was worked that was not approved, reviewed, or tracked, prior to the current system manager's arrival, a letter is being developed and will then be signed by all staff members stating that they have no knowledge of any hours that were worked, for which there was no remuneration by their employer. This will letter be filed, and alleviate any concerns about issues such as this from the past.

B. SYSTEM CONTROL

1. SYSTEM ACCESS

Audit recommends LVACTS management should establish and implement strict password rules to prevent unauthorized system access.

Management's Plan of Action and Timetable:

This recommendation is an excellent suggestion, and once the LVACTS organization has sole administrative rights to the system, after final system acceptance, this will be implemented immediately.

2. SYSTEM BACK-UP AND RESTORATION

1. Audit recommends LVACTS management should reassess the adequacy of the current system back-up and restoration procedures, as in Appendix A.

Management's Plan of Action and Timetable:

A point must be clarified here concerning the "old system" and the "new system." These are two divergent technologies nearly twenty years apart. Accordingly, the handling of back up and restoration procedures will naturally be handled in a different manner for each.

As such, the documentation and procedures for back up and restoration of data on the "new system" will be delivered by the system integrator upon final acceptance as contractually required. We will verify all of the practices noted in Appendix A will be checked for delivery in the final acceptance of this documentation.

The “old system” has had a back-up and restoration procedure in effect since it was put into service sixteen years ago. Daily UTCS backups are performed with weekly backups onto tape drives. Two copies are made for later retrieval. This process has worked without fail since the mid 1980’s and we have no reason to believe it will not work until the system is finally decommissioned, in the near future. To minimize concern generated by this audit, we will have these procedures documented, along with the frequency at which they occur within the next four months.

We will also pursue the location of an off-site storage facility. It is likely we will be working with the city’s Information Technologies Department in determining an adequate location. We will endeavor to have such a location within the next six to eight months, and use it for storage of both “new system” and “old system” archives.

2. Audit recommends that system back-up and restoration procedures should be documented and implemented.

Management’s Plan of Action and Timetable:

See above section(s).

3. PREVENTATIVE MAINTENANCE

1. Audit recommends LVACTS should establish and implement a formal preventative maintenance program.

Management’s Plan of Action and Timetable:

Current LVACTS management realizes that in the past a different emphasis may have been place on maintenance of the system by past Managers. Today, however, because of the OMC’s direction, a new focus towards a combination of in-house and out-sourced preventative maintenance is provided by the LVACTS operation. We have started the process by showing the following examples:

- Preventive maintenance on the CCTV system has begun by in-house staff.
- Periodic checks and maintenance of the backbone microwave system are now being performed by in-house staff.
- We have out-sourced contracts for preventative maintenance on the Uninterruptible Power Supply (UPS) within the TMC.
- We have performed various preventative maintenance procedures on the UPS located in the Hub cabinets.
- We have a maintenance contract for the Perkin/Elmer 3230 (this has been in effect since the unit was installed).

- We have begun accepting competitive quotes for preventative maintenance on the air conditioning units within the hub cabinets.
- We have requested a official proposal for the original installer of the backbone microwave system for a multi-level service maintenance contract.
- We have begun to develop specifications for loop detector maintenance to be out sourced.

In a far-reaching, money-saving, and efficiency-improving move, the OMC has approved hiring of additional communication staff as well as other staff to help in the preventative maintenance. The current LVACTS Manager is presently in discussions with Human Resources in finalizing the job description for these positions.

4. STANDARDIZATION OF HARDWARE AND SOFTWARE

Audit recommends LVACTS management should work with the OMC to develop hardware and software standards.

Management's Plan of Action and Timetable:

This section in the auditor's report insinuates that the OMC has no standardization of equipment within the system. In fact, this is not the case, since a major reason for using the 2070N as the traffic signal controller, as opposed to others, within the new system was for equipment and operating software standardization. Because of this decision, we now have an "open architecture" design and greater equipment standardization than ever before. We have moved from over a dozen different types of controllers used to operate the traffic signals in the valley, to a single one. Additionally, we have went from an extremely expensive communication unit (the Sonex LCIU) on the old system to a relatively inexpensive modem used throughout the new system.

In relation to the new system, the old system had few components, and LVACTS worked with the OMC to develop county-wide specifications approved through the Regional Transportation Commission (RTC) specification process. These specifications are then used by all local agencies in the valley when letting projects go to contract. This process will be continued with the new system, and its assorted components. As an example, in the past six months, current LVACTS management has developed standardized specifications for Data Radio, CCTV equipment, PTZ Receivers, and Fiber Optic equipment. As other pieces of equipment are purchased, additional specifications will be developed for LVACTS and Agency use. We expect this process will continue as new equipment is brought on line in the system.

In addition to all of this work done by LVACTS staff, there is Communications Master Plan developed and approved by the OMC that is currently being completed by a consultant from which the stakeholders of the system can draw. This plan will identify future growth plans, as well as standards and specifications to be reviewed and potentially adopted by the local agencies, LVACTS, and the

RTC. This is a unified, valley-wide approach to standardization, and will help give us an expert, unbiased opinion with respect to them.

One caveat that is important to understand is that traffic system technology changes because it takes advantage of advances in computing and communications, with improvements seen every almost daily in the industry. Accordingly, we feel this organization would not be doing its job to the taxpayers most efficiently if we were to stagnate, and not take advantage of the latest proven, cost-effective technologies. This organization, therefore, must be ever vigilant, and not fall guilty to the very real concern of “over standardization,” which has been a problem seen in other organizations.

5. SYSTEM MONITORING

1. Audit recommends LVACTS should implement system-monitoring tools such as anti-virus, change control, and system performance software to maintain the integrity of the traffic control system.

Much of this software recommended by the audit will be provided the system integrator before final acceptance. The software that is not supplied, yet will be needed, will need to be identified as compatible with the proprietary software used for system control. Consultation with the software developer will occur to ascertain the ability to interface with our central system software upon final acceptance, and we intend to use the audit’s guidelines for required functionality. We will know more after the new system becomes ours.

- 2 Audit recommends LVACTS should maintain electronic records of communication and controller errors.

Though due to technological shortcomings, we could not do what this recommendation states on the UTCS system, this has always been the intent with the new system. The software developer has assured us that the logging feature will be active within the supplied software. With this feature, used in conjunction with the archiving of specific data, we will be able to maintain electronic records of communication and controller events, for retrieval at a later date. These will not only be limited to “failures,” but will encompass all events.

3. Audit recommends LVACTS management should perform a cost-benefit analysis for staffing LVACTS 24/7 for monitoring purposes to decrease traffic congestion.

As traffic in the valley has increased, staffing levels at the TMC have increased to handle it as well. Additionally, the hours of the TMC have changed from the original hours of operation due to this higher level of staffing. At current staffing levels, we cannot operate efficiently outside the critical time from of 7:00 A.M. to 6:00 P.M. This covers the critical morning and evening peak traffic periods.

As we review the traffic count data that has recently begun to be acquired by LVACTS staff, we will review the level of service provided to the motorists, and will investigate the potential of

additional hours of coverage for the TMC. If we indeed find additional coverage to be founded as a result of a cost-benefit analysis, a proposal will be submitted to the OMC recommending for additional budgeted positions, and approved through our normal budget process. Since FY01-02 is already submitted and approved, the earliest this can be accomplished is during FY02-03.

As a future enhancement of services to the taxpayers, the next generation of the LVACTS system is programmed to be known as the Arterial Management System (AMS) division within the Freeway and Arterial System of Transportation (FAST). When we evolve into this operation, the first truly regional ITS operation in the country, with 100% participation by all agencies, will be formed. Accordingly, the organization will handle traffic flows on the freeways in addition to those on the surface street arterials. With this move, the combined TMC then will be staffed and operated at expanded hours; this is currently slated to be manned on a 24-7 schedule.

In closing, we would like to let everyone understand that an efficient, effective LVACTS operation is the desire and goal of the Operations Management Committee as well as the current LVACTS management. This can be only be achieved by continual introspection and constant improvement to the services we provide at the lowest cost possible. Because of the guidance of the Committee, the actions of the current LVACTS management, and the efforts of the LVACTS staff, much has changed with regards to LVACTS over the course of the past year. These changes, however, are only the beginning, with more positive ones yet to come. The Committee wants to reemphasize that they have made, and will continue to make, the tough decisions needed to propel this organization forward, and as Acting LVACTS System Manager, I would like to wholeheartedly echo this sentiment, for my greatest desire is to give the public the best traffic signal system they can possibly have.

Response compiled and prepared by:

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